April 1, 2011 Water Supply Forecast Discussion

This forecast includes observed conditions through March 2011.
http://cdec.water.ca.gov/cgi-progs/iodir/B120

Forecast Summary:
The projected median April-July runoff in the major Sierra river basins draining westward ranges from 113 percent on the Pit River to 184 percent on the Kern River at Lake Isabella. The East Walker River, an eastward draining river, is expected to have an April-July runoff near 195 percent of average. Considering all major Sierra rivers, the forecast calls for an April-July runoff of nearly 165 percent of average.

Considering major Sierra rivers draining westward, the forecasted median Water Year (WY) runoff ranges from 108 percent of average for the Inflow into Shasta Reservoir to 186 percent on the Cosumnes River.

March was a remarkable month for gains in snowpack, precipitation, and runoff. All regions of the Sierra received well over normal precipitation amounts except for the South Lahontan. The largest amounts of precipitation, as measured by percent of average, were in the Sacramento and San Joaquin regions. The Tulare Lake region, which had the smallest percent of average, received 179 percent of average.

This WSI forecast can be summarized as follows:

Sacramento River Unimpaired Runoff Water Year Forecast	**23.8 MAF**
(50 percent exceedance)	(128 percent of normal)
Sacramento Valley Index (SVI)	**10.0**
(50 percent exceedance)	(Wet)
San Joaquin Valley Index (SJI)	**5.1**
(75 percent exceedance)	(Wet)

The SVI increased to 10.0 from 7.7 while the SJI increased to 5.1 from 3.9 from the March 1, 2011 WSI.

Runoff:
Sierra flow data for March indicates that the highest percent of average, from a regional perspective, occurred in the San Joaquin Region which had 214 percent of average. Flows in the Sacramento River and Tulare Lake regions were between 170 and 175 percent of average. Considering the rivers in these three regions, the March flows exceeded 200 percent of average for five rivers (American, Cosumnes, Stanislaus, Tuolumne, and Merced).

Even though the season has been wet, the Pit River flows are anomalous to the statewide pattern. Water Year flows-to-date in the Pit River basin have been only 90 percent of average.

Precipitation:
This 2011 Water Year serves as a prime example of the extreme variability that can occur within a single water year in California. The Northern Sierra 8-Station Precipitation Index recorded the 6th wettest October, the 8th driest January, and the 3rd wettest March on record. Similarly, the San Joaquin 5-Station Precipitation Index registered the wettest October, the 3rd wettest

December, a rather dry January, and the 6th wettest March on record. The San Joaquin index recorded a gain of about 6.5 inches from March 14 through March 20 whereas this index gained only 4.3 inches during the entire period from January 1 through February 15. California experienced less than 32 percent of average precipitation statewide in January (usually the wettest month of the year) and yet the statewide water year-to-date average stands at 141 percent. All these parameters are a testament to the variability the state can and has experienced.

For March, the Northern Sierra 8-Station Precipitation index gained 18.5 inches (268 percent of the monthly average). This accumulation brought the water year-to-date total in the Northern Sierra to 61.0 inches (146 percent of average to date and 11 inches over the average WY total). Similarly, the San Joaquin 5-Station Precipitation Index gained 14.1 inches in March which was 231 percent of the monthly average. This brought the water year-to-date total to 56.0 inches (167 percent of average-to-date and 15.2 inches over the average WY amount). At the end of March, the index value was within one inch of the entire WY 2006 value.

From a regional perspective, accumulated precipitation (based on all available precipitation stations) during March in the Sacramento and San Joaquin River basins was 252 and 232 percent, respectively. The Tulare Lake Region, although having a percent of average less than the two regions to the north, had 179 percent of average.

For the WY-to-date, however, the percent of averages for the Sacramento, San Joaquin, and Tulare Lake regions were 137, 158, and 162 percent of average, respectively. Statewide, the Oct-Mar precipitation was 140 percent of average.

Snowpack:

On April 1, snow sensors recorded a snow pack that was 173 percent of average in the Northern Sierra, 162 percent of average in the Central Sierra, and 155 percent of average in the Southern Sierra. Statewide, snow water equivalent based on snow pillow data was 163 percent of the historical April 1 average.

Measurements from snow courses, based on April 1 surveys, indicate that the pack was 171 percent of average in the Northern Sierra, 176 percent of average in the Central Sierra, and 183 percent of average in the Southern Sierra.

Earlier in the season, the low elevation courses and sensors had a higher percent of average than those in the higher regions of most basins. Speculation existed about how much of the low elevation snow would prevail to April 1. With the April data available, one can conclude that the lower elevation water content still has higher percents of average than sites at higher altitudes in most basins.

Statewide, there are about 45 courses at which the water content is over 200 percent of average.

Every Sierra westside basin from the Feather River southward has at least 170 percent of average water content, based on course data.

Statewide, the snowpack is the fifth largest in the last 60 years and the highest since 1995.

Weather and Climate Outlook:

The weather forecast for the next six days is dry except for a few showers today. These showers are not expected to produce any significant increase in the snow pack or in the April-July runoff. Currently, the state is experiencing below normal temperatures with most areas of the Sierra having freezing levels below 4500 feet. During the next three days, however, a warming trend is expected that will raise the freezing level to 5000 to 7000 feet over the northern Sierra and from 7000 to 9000 feet over the southern Sierra by Sunday. These conditions are expected to persist through Tuesday.

The 6 to 10 day outlook (April 13-17) calls for increased chances of above normal precipitation north of a line from Lake Tahoe to Big Sur and increased chances of below normal precipitation over the southern third of the State.

Considering the large snowpack, the one-month and three-month outlooks for precipitation and temperatures bear watching.

The Climate Prediction Center's (CPC) one-month outlook for April updated on March 31, suggests below normal temperatures for the northern two-thirds of the state. The same outlook suggests below normal precipitation over the southern two-thirds of the state and above normal precipitation over the north coast and Klamath River regions of California.

The CPC's three-month outlook (April-June) was last updated March 17, 2011. This outlook suggests equal chances of above or below normal precipitation over the entire state. The same forecast indicates a slightly greater chance of above normal temperatures over the far southern end of the Sierra and equal chances of above and below normal temperatures over all other regions of the range.

The latest La Nina/El Nino discussion by the Climate Prediction Center states that La Nina weakened for the third consecutive month. Nearly all models indicate La Nina will continue weakening in the next several months.

Next Update:
A Bulletin 120 Update for conditions on April 12, 2011 will be available Thursday, April 14.

If you have any questions regarding this forecast, please contact a member of the Snow Surveys staff.

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Important Links
Full Natural Flow Data:
Daily FNF
http://cdec.water.ca.gov/cgi-progs/reports/FNF
Monthly FNF
http://cdec.water.ca.gov/cgi-progs/reports/FNFSUM

Seasonal FNF
http://cdec.water.ca.gov/cgi-progs/reports/FLOWOUT

Precipitation Data:
Northern Sierra 8-Station Precipitation Tabulation Table
http://cdec.water.ca.gov/cgi-progs/products/8-Stations_Tab.pdf
San Joaquin 5-Station Precipitation Tabulation Table
http://cdec.water.ca.gov/cgi-progs/products/5-Stations_Tab.pdf
2010 WY Precipitation Summary
http://cdec.water.ca.gov/cgi-progs/precip/PRECIPSUM

Snow Data:
Latest Snow Sensor Report
http://cdec.water.ca.gov/cgi-progs/snow/PAGE6
Latest Statewide Summary of Snow Water Equivalents
http://cdec.water.ca.gov/cgi-progs/snow/DLYSWEQ
Monthly Snow Course Report
http://cdec.water.ca.gov/cgi-progs/snow/COURSES

Extended Regional Forecasts:
California Nevada River Forecast Center 6 Day QPF and Snow Level Forecast
http://www.cnrfc.noaa.gov/awipsProducts/RNOHD6RSA.php
Climate Prediction Center One-Month Outlook Forecasts
http://www.cpc.noaa.gov/products/predictions/30day/
Climate Prediction Center Three-Month Outlook Forecasts
http://www.cpc.noaa.gov/products/predictions/90day/

Drought Information:
U.S. Seasonal Drought Outlook
http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html

El Nino/La Nina:
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/